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USE OF GAMES IN ECONOMIC ANALYSIS

Frederick B. Thompson

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USE OF GAMES IN ECONOMIC ANALYSIS

Frederick B. Thompson

This paper is a discussion of a new econometric model structure. The two goals underlying its development are: (1) to find a structure which could handle situations involving the results of interaction of large numbers of simple elements over time under a centralized control; (2) to find a structure which is reasonably computable so that various control policies could be tested and compared.

The presentation of the structure is divided into three parts: first, its motivation from the point of view of the operations analyst, of the economist and of the mathematicians; second, a brief description of it, and third; a discussion of two examples: A model of a complete economy, and a model of an industrial establishment. In the first part, the following points will be mentioned. The operations analyst cannot apply game theory to most realistic problems, but the game playing approach offers real possibilities as a tool for analysis. In order to make such an approach applicable, it is desirable that some structure be developed for the interaction of high-speed computers and game-players. The economist, in order to see behind very aggregate models, faces problems involving the interactions of thousands of elements. This is especially true in looking at

regional problems and the role of transportation. Some computing structure is necessary so that this interaction can be studied. The mathematician finds that applications of linear techniques so far developed lead to tremendously large systems of equations. The best hope seems to be to find a method of taking advantage of all the zeros usually found in these systems. After these problems of analyst, economist and mathematician are described, the model structure under discussion is offered as a tentative solution.